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The 1987 Whelk Fishery in the Newfoundland Region

J. Flight

Fisheries Development Division
Fisheries and Habitat Management
Newfoundland Region
P.O. Box 5667
St. John's, Newfoundland
A1C 5X1

July 1988

Canadian Technical Report of Fisheries and Aquatic Sciences No. 1630

Fisheries and Oceans Pêches et Océans

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by

J. Flight[1]

Fisheries Development Division
Fisheries and Habitat Management
Newfoundland Region
P.O. Box 5667
St. John's, Newfoundland
A1C 5X1

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[1]Jim Flight. St. John's, under contract to Department of Fisheries and Oceans during this project.

89-04959/

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Cat. No. Fs 97-6/1630E ISSN 0706-6457

Correct citation for this publication:

Flight, Jim, 1988. The 1987 Whelk Fishery in the Newfoundland Region, 1987. Cat. Tech. Rep. Fish. Aquat. Sci 1630: vi + 43p.

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ABSTRACT

Flight, J. 1987. The 1987 Whelk Fishery in the Newfoundland Region Can. Tech. Fish. Aquat. Sci. 1630. Vi + 43p.

In 1987, the Newfoundland Region experienced its first attempt at the whelk fishery. For a number of reasons, the fishery did not proceed as anticipated. Interest in developing a commercial fishery was exemplified by the number of fishermen licenced, the number of processors considering involvement, and the introduction of gear to harvest and process the species. Marketability of whelk and availability of resource were important contributing factors to the non-establishment of the whelk fishery in Newfoundland during 1987.

En 1987, la règion de Terre-Neuve a fait ses premières tentatives de pêche du buccin. Pour diverses raisons, cette pêche n'a donnè les rèsultats escomptès. Toutefois, le nombre de permis dèlivrès, de transformateurs intèressès st l'introduction d'engins de pêche et de transformation de cette espèce tèmoignent de l'attention favorable que suscite l'ètablissement d'une pêche commerciale du buccin. Mais, les possibilitiès de commercialisation et la disponibilitè de la ressource ont grandement militè contre le dèveloppement de cette pêche a Terre-Neuve en 1987.

PREFACE

Following inquiries from both fishermen and processors throughout the Newfoundland Region in 1986, the Fisheries Development Division of the Fisheries and Habitat Management Branch, Department of Fisheries and Oceans, decided to become involved in promoting the development of the commercial whelk fishery. A commitment was later made to conduct a study of the potential whelk fishery during the 1987/88 fiscal year. Encouraging the commercial development of whelk as a complementary fishery supports one of the Division's main objectives - expansion of the commercially harvestable resource base.

The opinions expressed in this report are those of the author and do not necessarily reflect those of the Department of Fisheries and Oceans.

This report was produced under DFO/DSS Contract FP001-7-2045/01-XAQ.

Scientific Authority

Mr. Eric Way
Technical Development Officer
Fisheries Development Division
Fisheries and Habitat Management Branch
P.O. Box 5667
St. John's, Newfoundland.
A1C 5X1

INTRODUCTION

The whelk development project was established to assist and encourage small boat fishermen and processors in establishing a commercial whelk fishery in Newfoundland. Monitoring all related activities of the whelk fishery would be the main focus of the project. The information collected would allow the Fisheries Development Division to ascertain the potential of this new fishery and the areas where the fishery may be developed.

Based upon the number of inquiries and the amount of interest expressed from both fishermen and processors, it was anticipated this fishery could establish itself. However, the results of the 1987 fishing season were less promising than expected from a participation point of view with respect to both harvesting and processing. At the outset the Division's primary role was to observe and to provide assistance if required. As the season progressed it became evident the Division had to assume a leadership role and encourage potential participants to become involved and alternatively determine what caused a slowdown in whelk fishing activity.

The Fisheries Development Division expected whelk fishing to occur simultaneously with the lobster season since both entail similar types of harvesting techniques and there is a history of whelk being a by-catch of lobster fishermen. A spring start at whelks fishing would have enabled fishermen to familiarize themselves with the new species and the associated gear and techniques. Whelk fishing was intended to be combined with other traditional fisheries. It was anticipated that increased earnings of fishermen and increased viability of small processing plants would result from a whelk fishery.

The whelk (Buccinum undatum), also known as the common or rough whelk, can be found from Labrador to New Jersey and on the European Atlantic Coast south to the Mediterranean Sea. Some local names for whelks in Newfoundland are snails, wrinkles, or cuckoos. Belonging to a group of shellfish named gastropods, the whelk is characterized by its large muscular foot which is used for travelling over the sea bottom. It is this muscular foot which comprises the whelk meat sought by the marketplace. The whelk is a carnivorous marine animal with a spirally coiled shell and is usually harvested from muddy or sandy grounds. In Newfoundland, inshore whelk may grow to 100mm in length and are a greenish brown colour while offshore whelk which grow up to 150mm have a white or tan colour.

The chronological development of the whelk fishery in Newfoundland can best be described as progressing from a traditional food fishery in some areas and non-existent in most to a growing concern during the past two and a half years. Studies completed by the Provincial Department of Fisheries in 1972 and 1983 concluded that the whelk fishery was not an attractive new fishery although there was evidence of potential whelk resource. For more than a decade there was no obvious activity relating to whelk.

Crab fishermen first considered the possibility of harvesting whelk as a by-catch in 1985. This followed in 1986 with processors and inshore fishermen expressing interest and requesting information from DFO's Fisheries Development Branch, as it was known then. The Branch acquired and distributed information from colleagues in Quebec who by this time were managing a full-time fishery. Throughout 1986 and the winter of 1987 there were numerous processors and individual fishermen attracted to the idea of

participating in a new fishery. During the fall of 1986 two processors bought small amounts of whelk locally; one having purchased a crushing machine and the second acquiring a machine in the spring of 1987. Whelk pots were loaned to many fishermen and processors in an effort to respond to the interest. As many as 20 plant operators have indicated an interest or considered processing whelk. The apparent interest and pressure to develop a whelk fishery culminated with the introduction of an Inshore Whelk Management Plan for the Newfoundland Region. The Newfoundland Section of the Gulf Region also announced a Management Plan for 1987. With the significant number of inquiries by both fishermen and processors during the past two years, expectations by DFO officials were understandably high. Unfortunately, the turn of events did not reflect that interest as other factors prevailed.

This report describes the attempt to develop the whelk fishery in Newfoundland during 1987. Various subjects pertaining to the development of a whelk fishery have been examined ranging from the 1987 Whelk Management Plan, to problems encountered in data collection.

1987 INSHORE WHELK MANAGEMENT PLAN

With the increasing interest in the Newfoundland Region during the fall of 1986 and winter of 1987, coupled with the establishment of a fully regulated whelk fishery in Quebec, the Fisheries and Habitat Management Branch introduced the 1987 Inshore Whelk Management Plan. A management plan allows for a systematic approach to regulating the participants and controlling effort for a particular species.

In the Newfoundland Region, there are three area offices and one district office which administer the licensing of the respective fisheries in each area. Area 1 (St. John's) and 3 (Grand Falls) and the District Office in Goose Bay issued whelk licences. In Area 2 (Grand Bank) no fishermen applied for licences. During May and June there was more of a demand for licences in some areas compared to others. Initially the Management Plan specified only 30 licences per bay; however this was altered as significantly less requests were received from some bays. For instance, Bonavista Bay had 75 licences issued, Conception Bay two and Placentia Bay none.

The eligibility criteria to qualify for a whelk licence in 1987 are as follows:

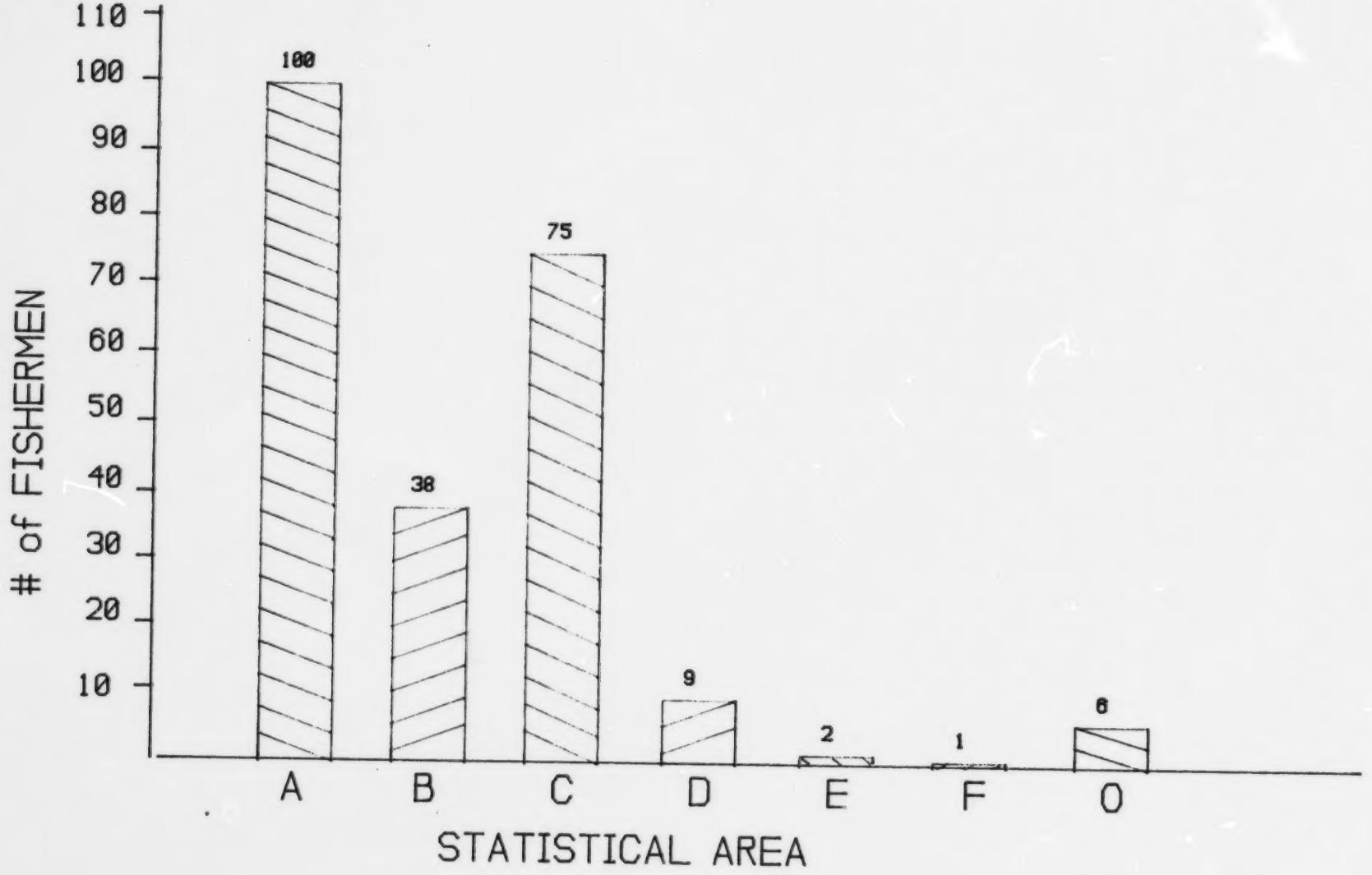
1. Full-time fishermen must hold fixed gear groundfish licences and own/operate a registered commercial fishing vessel less than 35 feet L.O.A. (Length Overall).
2. Fishermen must have been head of the fishing enterprise for the past three consecutive years.

3. Fishermen must be a resident of the area for which the licence is issued.
4. Fishermen must have purchased the appropriate whelk gear and must be ready to fish prior to the permit being issued.
5. Persons who have not geared up by August 1, 1987 will not be issued a permit.

The licence fee was thirty dollars ($30.00) and the maximum number of traps/pots allowed to a permit was fifty (50). Items four and five of the eligibility criteria were difficult to interpret and enforce by Fishery Officers. There were concerns by research personnel and Fishery Officers regarding the potential by-catch, especially lobster and the lack of gear specifications.

A total of 231 licences was issued in the Newfoundland Region. Table 1 and Figure 1 outline the distribution of licenced whelk fishermen for 1987 by fisheries statistical boundaries. The majority of licences are concentrated in three areas - the Northern Peninsula/White Bay, Notre Dame Bay, and Bonavista Bay. It is fair to assume that if the whelk fishery had developed as expected the number of licences would have increased. It appears many fishermen obtained a whelk licence anticipating that since this is a new fishery it may become designated as limited entry applying to other species such as crab, lobster, and salmon. Some licences were acquired in the event that the whelk fishery may become lucrative and demonstrated concern that a licence might then be difficult to obtain.

TABLE 1. DISTRIBUTION OF LICENCED WHELK FISHERMEN IN THE NEWFOUNDLAND REGION FOR 1987



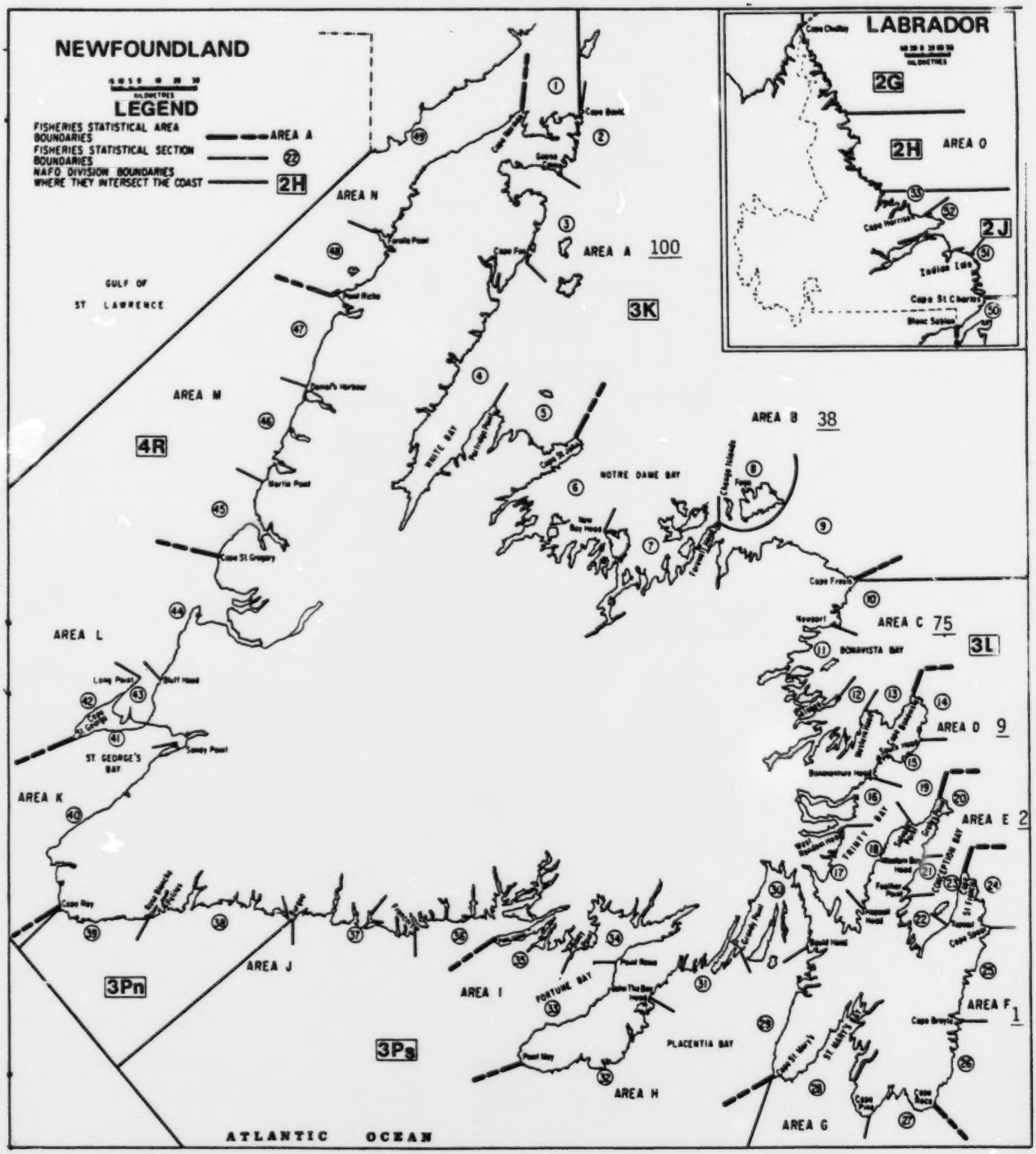


FIG. 1. DISTRIBUTION OF LICENCED WHELK FISHERMEN FOR 1987 (NEWFOUNDLAND REGION ONLY)

HARVESTING AND PROCESSING EQUIPMENT

The introduction of a new fishery creates the potential for the development of a range of gear and equipment to accommodate harvesting and processing of that fishery. The whelk fishery has been no exception. Fortunately, the initial fears of gear proliferation have subsided and some conformity has prevailed. The cone-shaped whelk pot/trap which is a smaller version of the crab pot has become the accepted gear type among both fishermen and processors. The Fisheries Development Division and the Provincial Department of Fisheries have distributed the cone-shaped pots to interested fishermen and processors to a number of areas in Newfoundland. Some processors have given pots to fishermen while many fishermen have purchased pots directly from suppliers. The price of a pot including linnet or webbing is between $14.00 and $20.00. Iron frames only are available for $10.00 - $12.00 and fishermen apply the linnet. The following suppliers provided pots to fishermen and processors in 1987:

Ford Woodman - Dildo

Land & Sea Welding - Carbonear

Dawe's Welding - Barneed

Shoal Bay Forge - Dover

Inshore Midshore - Port aux Choix

Ron Connolly - Port Rexton

Very little whelk processing equipment was being utilized in Newfoundland during 1987. Unlike Quebec, where the majority of processing is mechanized, a crusher was the only piece of equipment used. Other

facilities such as a shell remover/separator and a gutting machine have not been introduced. To date, only two processors have a crusher but others have indicated they are contemplating the acquisition of one. The crusher was manufactured in Ontario by:

All Type Welding
1818 Berkel Road
Mississauga, Ontario
L4X 1M7

It is now available from a Newfoundland firm:

C & W Welding
Bay Bulls
Newfoundland
AOA 1CO

A Japanese company has a larger crushing machine available which is considered to be financially excessive for the amount of whelk processing anticipated.

Taito Seiko Co. Ltd.
P.O. Box 603
St. John's, Newfoundland
A1C 5K8

A mechanized processing line, similar to those operating in Quebec, is estimated involve a capital expenditure of up to $40,000.00.

PERFORMANCE OF 1987 WHELK FISHERY

With some 230 fishermen licenced to harvest whelk in the Newfoundland Region and some buyers prepared to process, it would be expected that sufficient interest would be generated to develop at least a limited scale fishery. The lack of success in establishing such a fishery in Newfoundland is attributable to a number of factors.

The demands of the marketplace govern whether a fishery will prosper, stagnate, or fail. The whelk fishery is no different and the lower price for whelk product in 1987 translated generally into a "wait and see approach" by both fishermen and processors. Soft markets meant a low profit margin or return to processors and reciprocally a low price to fishermen. Processors delayed purchasing equipment or buying whelk until a stable market price was evident. There was also a reluctance on the part of fishermen in the fishery as they were cautious to commit a capital expenditure of up to $1,000.00 for gear when there was no guarantee of a return on investment or recovery of costs. With the price of whelk meat reportedly as low as $1.15 - $1.25 U.S. per pound, Newfoundland processors were hesitant to participate in the fishery bearing in mind the high cost of transportation and labour associated with a manual operation. The stark reality for processors who planned to operate during 1987 was the significant drop in market prices compared to 1986. The Quebec industry received approximately $2.60 Canadian in 1986 but could only generate $1.60 - $1.70 in 1987.

The overall success of other species such as cod, salmon, capelin, lumpfish and turbot high prices paid for these species detracted from the development of a whelk fishery. Record high prices paid to fishermen for the traditional species discouraged them from harvesting whelk at 15 - 20¢ per pound in shell despite the fact it is a complementary fishery. Most licenced whelk fishermen did not have to harvest whelk to experience a successful year overall. It should be noted that some fishermen would have sold at low prices if a buyer had been available. Processors experienced a good season overall and it was realized whelk would not produce the profits derived from other species. Put simply, whelk fishing was accepted as not being worth the effort in 1987.

More and more fishermen are seeking alternate income sources and want to diversify as it is becoming increasingly difficult for one to sustain a livelihood from the fishery. Whelk is recognized as a possible income supplement but fishermen feel the price has to increase in order for whelk to develop into an annual fishery like other species. Some fishermen commented that at this point in time it was best for all concerned to leave the whelk in the water until the price justified fishing it or fishermen are forced to harvest and sell the product. On the Northern Peninsula, buyers offered prices between 50¢ and 75¢ per pound for a two week period in June and this created high hopes for the fledgling fishery. The true market of whelk could not have been known.

The availability of the resource was a major concern of both fishermen and processors. In most areas, fishermen reported that whelks were available but there was no scientific evidence or history of whelk fishing

in the majority of the areas. The Northern Peninsula has had a recreational or food fishery and this area did record the most abundant whelk landings. Fishermen and processors again were resistant to spend money when there were no proven stocks of whelk. With the low prices being offered, many felt whelk had to become a volume fishery similar to capelin in order to be viable.

The Newfoundland produced whelk is destined for the Japanese market not the United States market where Quebec's whelk industry is marketing the majority of its product. Newfoundland processors involved and those considering to become involved with whelk are dependent on their Japanese agents with whom they deal for capelin to develop or attract markets. This trend no doubt limits the leverage of Newfoundland processors and restricts their potential markets. The Japanese have proven to be extremely maticulous respecting acceptance of capelin products and cannot be expected to change this attitude regarding whelks.

In Area 2, which serves the Burin Peninsula and South Coast, not a single licence was issued. Originally, St. Mary's Bay and Placentia Bay were included as part of the project but received little attention because there was a change in focus to the northeast coast. As with Trinity Bay and Conception Bay in Area 1 where licences were very low it seems the fishermen were either not informed of developments regarding whelk, were not interested, or there was no buyer to encourage participation.

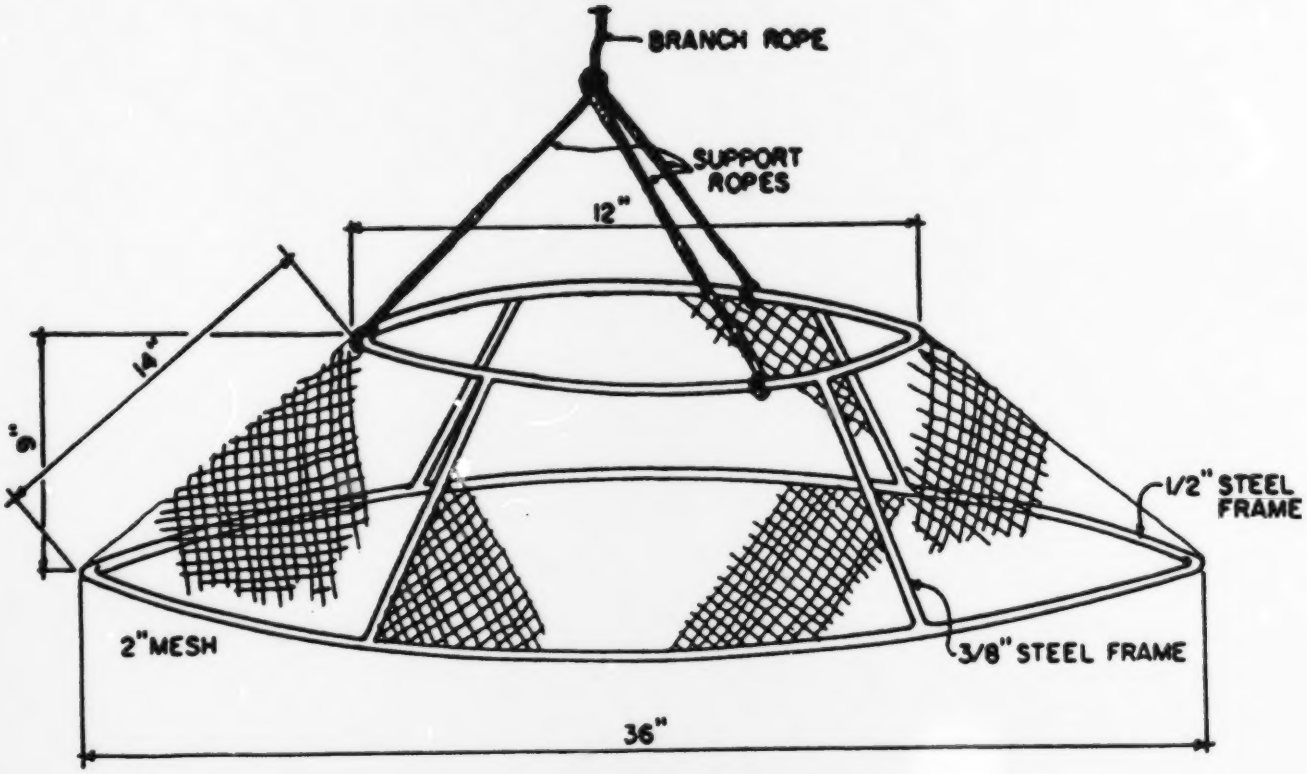
Any new undertaking will endure growing pains and make advances; the whelk fishery of 1987 did. In light of the problems encountered, the industry and only the industry, can respond to the needs and create a commercial whelk fishery.

HARVESTING

Even though the whelk fishery did not fully develop commercially, there was sufficient activity to determine the harvesting and handling methods of fishermen. Most fishermen are familiar with the cone-shaped pot which has been promoted by the Fisheries Development Division, Resource Management, and the Provincial Department of Fisheries. The conical pot is a scaled-down version of a crab pot with less steeply sloped sides (Figure 2). It has a 30" - 36" diameter base, 12" - 15" diameter top, is from 7" - 9" in height overall, and is covered with a 1/2" mesh netting. Whelk are fished mainly from speed boats ranging from 17' - 25' L.O.A. The fishery is very near shore in water depth between 5 - 20 fathoms. Pots are set individually like lobster pots. The trawl method of having pots in a line joined together was not well accepted. Fishermen felt they could land more whelk if pots were separate and they could cover more ground. Catches seem to be best on sandy-muddy bottoms.

A small number of longliners (vessels greater than 35' L.O.A.) have been approved permits to catch offshore or deep water whelk. There was minimal effort, if any, for this type of fishery. However, there were some deep water whelk landed as a by-catch of crab fishermen at Little Bay Islands. The offshore whelk were much larger in size and weight and the meat yield was double that of inshore whelk. The high priced crab fishermen are not prepared to fish whelk pots as part of their crab operation. As a by-catch of the crab gear there should be no problem to deliver these whelk to the plant.

Fig. 2. A Cone-Shaped Whelk Pot



WHELK POT

Because there was no sustained whelk fishery in any one area, except for a two week period in the St. Anthony area in June and October, it is difficult to ascertain how fishermen would operate if this was a day to day fishery like cod. Fishermen were inconsistent when hauling gear. Sometimes pots would be out for one day and other times three days. If there was a buyer available on a continual basis and a schedule for collection then there may be less soak time and gear would be regularly retrieved. The abundance of resource would also be a factor in affecting how long gear is in the water between hauls.

Once whelk are landed fishermen hold them in crates, like lobster boxes, pounds, or bags which remain under water and secured. Besides selling his catch the main problem confronting a fisherman who can catch as high as 1000 pounds per day is storing his landings. When a buyer is collecting only once a week storage becomes a concern. Fishermen were not prepared for this. Their worst fear is that while awaiting shipment for sometimes more than a week the whelk may perish. There were instances of this beginning to happen and fishermen had to release their whelk, sometimes as much as 2000 pounds. Fortunately, whelk will live long periods in captivity and this is to the buyer's advantage as transportation costs can be reduced. However, a regular collection schedule would be in the best interest of fishermen and processors from a quality perspective.

There are numerous opinions on the type of bait that would best attract whelk. Some fishermen felt mackerel and herring were most effective while others used cod heads and frames or anything available that would serve as bait including rock crab, sculpins, and flatfish. Still

some fishermen, especially on the Northern Peninsula, felt salted bait was more productive. It is to assume that bait type for whelk can only be left to the judgement of the individual fisherman.

DATA COLLECTION

As part of the 1987 Inshore Whelk Management Plan, log books to record effort and landings were provided to licensed fishermen. However, the lack of fishing activity has hampered the collection of information. Samples gathered during harvesting do provide some knowledge of the size range of whelk found in Newfoundland waters.

Table 2 outlines the average length, weight, and yield of whelk samples. Each sample comprised of 25 - 50 animals. The whelk are not large but meat yields are quite good. This may be attributable to how the meat is prepared for market. The stomach and entrails are usually removed and sometimes the sexual organs depending on the customer's requirement for trimming. In Quebec, for instance, the penis is removed which produces lower yield. The one sample of offshore whelk was significantly larger in all respects and if it were in abundance and were higher priced would be very attractive to fishermen and processors alike. The offshore whelk averaged 122mm in length compared to 67mm for inshore whelk; weighed 89g compared to 50g and had a meat yield of 32g compared to 15g.

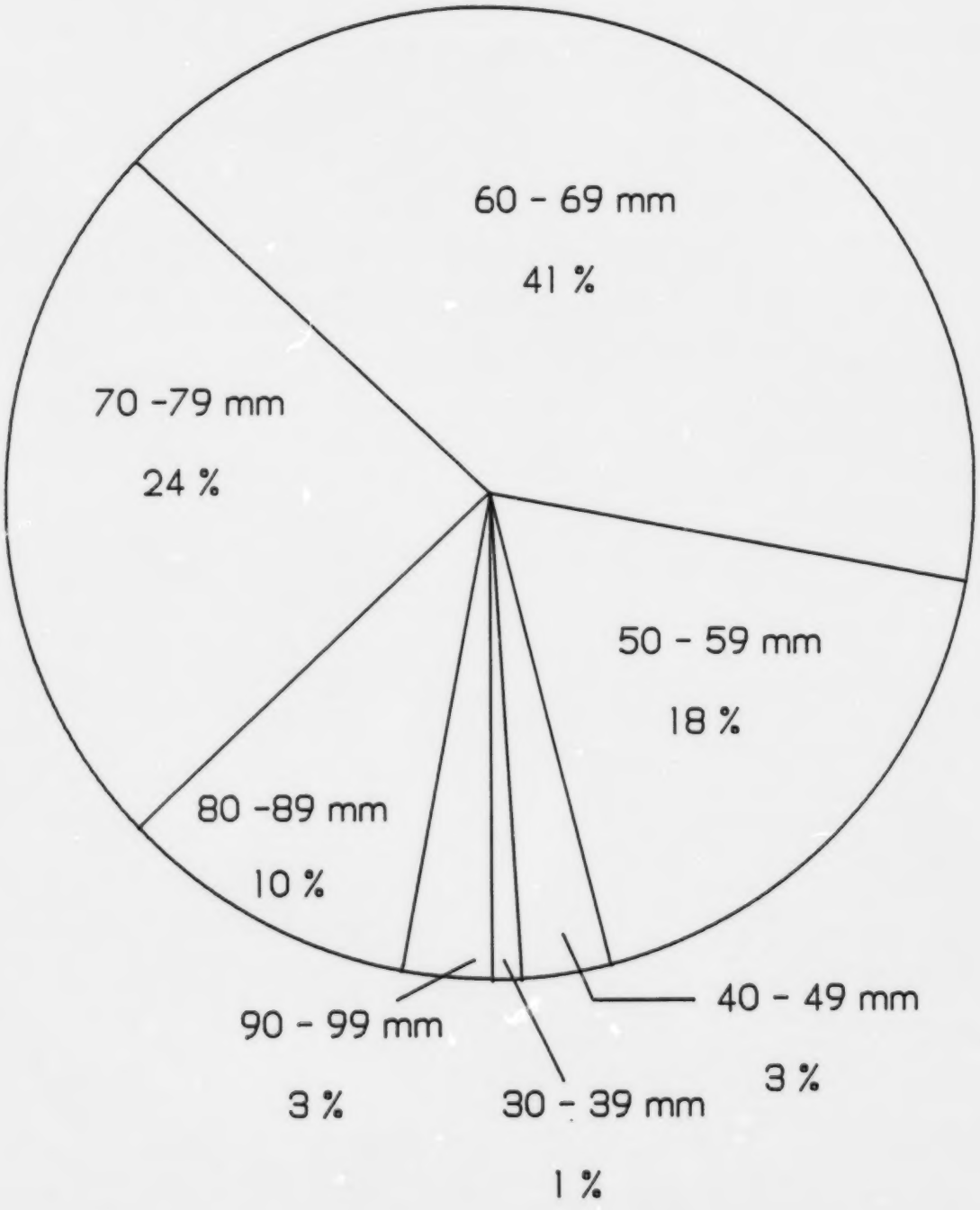
Size distribution by shell height of the whelk samples is presented in Figure 3. The majority of whelk are in the 60 - 79mm range with some 93% within the 50 - 89mm range. These are not large whelk according to market indications by processors. If processors decide to establish a minimum size limit as suggested by some operators then this could have a bearing on amount harvested especially if there are a lot of small whelk. The S.T. Jones and Son Ltd. project had approximately 43% of the product measuring less than 15g each.

TABLE 2. WHELK SAMPLES (AVERAGES)

LOCATION	HEIGHT(mm)	TOTAL WEIGHT(g)	SHUCKED WEIGHT(g)	YIELD(%)
Lumsden	63	47		
St. Lunaire	61			
Bonavista	74			
St. Lunaire	69	57.1	17.4	30.5
St. Anthony	72	51.0	15.7	30.8
St. Anthony	65	47.5	14.2	29.9
St. Anthony	64	45.5	14.3	31.4
Little Bay Islands (Offshore)	122	88.6	31.7	35.8

FIG. 3

SIZE DISTRIBUTION BY SHELL HEIGHT
OF
WHELK SAMPLES



The amount of resource and location still remains a major constraint to development. Fishermen are aware of whelk locations in their respective areas but cannot confirm the extent of the resource. From Placentia Bay to Labrador there are reports of whelk. There is a difference of opinion as to when is the best period for fishing whelk. Some fishermen feel the spring is the better time yet others believe the fall would give the best results. Fishermen have been successful during both spring and fall. There is a consensus that whelk are usually found on a sandy or smooth bottom. Like other species, fishermen will have to determine the amount of resource. Scientific information will most likely not exist for the development of the whelk fishery in the immediate future.

S.T. JONES AND SON LTD. CONTRACT

With no response from the processing sector to commence a whelk operation it was decided by the Fisheries Development Division to enter into a contractual agreement with S.T. Jones and Son Ltd. of Little Bay Islands in October. The objective of the contract encompassed "an evaluation of the harvesting, processing, and marketing potential of whelk in the Newfoundland Region". Based on the reported high incidence of whelk in the St. Lunaire - Griquet - St. Anthony area, coupled with the positive levels of landings experienced in June, S.T. Jones and Son Ltd. planned to purchase as much as 50,000 pounds of raw material. It was estimated this would have provided an approximate 10,000 pound sample for a market test.

The results of the project did not develop as expected because landings were significantly lower than previously harvested. This may be attributable to inclement weather, lack of fishing gear in the possession of fishermen, low prices and number of fishermen (four) involved. Despite these factors, there were days when good landings were made. For example, on several occasions 600 pounds were landed by one fishermen utilizing 35 pots. The fishermen were paid 15¢ per pound and were given an incentive of $130.00 per week regardless of amount landed. It is fair to say that if the 60 licensed fishermen of the area were active landings could exceed 15 - 20,000 pounds per day.

The processing aspect of this project provided the most important result of the project. The method of handling and processing whelk dictates whether this species can be considered for development in

Newfoundland. For this project the whelk had to be transported over long distances - 600 kilometers - and were held for as long as 36 hours in a truck. During hot weather a refrigerated truck would be used to prevent spoilage and death. Transportation costs were unusually high. With low amounts in the two trips (2140 and 2190 pounds respectively) it is difficult to determine the actual transportation costs.

The processor had been requested by his Japanese agent to prepare uncooked whelk meats in two size ranges (15 - 30 grams and 30 - 45 grams). Only 57% comprised the 15 - 30 gram size and there were no whelk available in the 30 - 45 gram size. Some 43% was less than 15 grams. The plant owner is concerned about the reaction of his broker to the amount of under-sized whelk and whether this will affect market acceptability and price which is not expected to be known until early 1988.

S.T. Jones and Son Ltd. utilized a manual operation except for a crushing machine. Between 20 and 35 people were employed to process the small amount of whelk taken during both trips. Activities included weighing, crushing, separating, washing, sorting, packaging, and freezing. Even though 1066 pounds of meat, or a 25% yield was realized, the high labour costs associated with this mode of processing is prohibitive. The labour costs alone exceed the market return for the finished product. This project determined that at current prices a manually operated venture is not viable. Under present conditions only a mechanized processing line will reduce high labour costs and thus the possibility of developing the whelk fishery further. S.T. Jones and Son Ltd. acknowledged it would not be feasible to become involved in whelk processing with present market conditions combined with a manual operation.

QUEBEC OVERVIEW

Although Newfoundland has not previously had a whelk fishery, an extensive fishery has existed in Quebec for many years. The markets were mainly confined to Quebec. Recent Japanese interest, beginning in 1985, has resulted in the Quebec fishery growing rapidly and landings rising dramatically. The Quebec Region of DFO introduced a Management Plan in 1986 and again in 1987 which covers mainly the Quebec North Shore, the area where all whelk activity occurs.

Landings in 1987 have exceeded the two million pound mark or 1000 metric tonnes. There were a total of 216 fishermen licenced but less than half actually participated in whelk fishing. Those fishermen involved have been experiencing good levels of landings and whelk has provided the main source of income for some fishermen. Fishermen were permitted to use 100 pots each in 1987 compared to the limit of 50 for 1986. The price paid to fishermen was 16¢ - 18¢ per pound in shell which was an increase on average of 4¢ per pound over the previous year. Processors received between $1.65 and $1.80 Canadian for final product from the marketplace. In 1986 prices to the processors were as high as $2.60. It is interesting to note that on the one hand market prices to the processor dropped yet on the other prices paid to fishermen increased during 1987.

There were three processing plants involved with whelk during 1987. The whelk meat is usually cooked by Quebec processors which is not the case with their Newfoundland counterparts. The Quebec fishery is surviving despite the drop in market price mainly because processors are mechanized

which rquires significantly less labour or manpower. The initial capital outlay for equipment is to be compensated by a marginal return of investment. As long as there is a whelk fishery in Quebec the likelihood of it developing in Newfoundland is greater.

CONCLUSION

An observer of the Newfoundland fishery would, in all probability, characterize the 1987 whelk fishery as generally a failure. This assessment would not be totally correct because a closer look will show positive strides have been made. The whelk fishery is still in the initial stages of development; however basic groundwork has been laid to allow a fishery in future. Barring the problems associated with market conditions and resource availability, the information and acquisition of gear has prompted an awareness of whelk throughout Newfoundland. A breakthrough with improved markets will probably see a ripple effect with whelk being harvested in all areas of the province.

Fishermen are prepared to participate in this fishery. There are some reservations as investment in equipment has not provided any return to date. The potential for extending the fishing season and creating an alternate and supplementary income source are reasons for optimism. Determining the extent of the resource is a contentious matter and is a major impediment to development. To this end, processors will want to be given some assurance of landing levels to ensure a mechanized operation, which is deemed the viable processing method under present circumstances, is not a losing venture.

The future development of the whelk fishery is contingent on two factors: market conditions or prices to processors and fishermen and abundance of resource. The first may precede the second because if the price is right fishermen will take it upon themselves to find the

resource. The foundation for the establishment of a new industry is in place. The direction it takes is now left to the discretion of and is the responsibility of industry and how it responds will determine the destiny of the Newfoundland whelk fishery.

APPENDIX I

LICENCED WHELK FISHERMEN IN NEWFOUNDLAND REGION

BY FISHERIES STATISTICAL BOUNDARIES AND COMMUNITY FOR 1987

APPENDIX I

LICENCED WHELK FISHERMEN IN NEWFOUNDLAND REGION

BY FISHERIES STATISTICAL BOUNDARIES AND COMMUNITY FOR 1987

AREA A	Section 2	60
	Section 4	32
	Section 5	8
		100
AREA B	Section 6	3
	Section 7	26
	Section 9	9
		38
AREA C	Section 10	42
	Section 11	30
	Section 12	1
	Section 13	2
		75
AREA D	Section 15	5
	Section 16	1
	Section 17	3
		9
AREA E	Section 22	1
	Section 23	1
		2
AREA F	Section 24	1
		1
AREA O	Section 51	4
	Section 52	2
		6
	TOTAL	231

AREA A

Section 2 60

Quirpon - 4
Griquet - 19
St. Lunaire - 7
Great Brehat - 1
St. Carols - 3
St. Anthony Bight - 5
St. Anthony - 17
Goose Cove - 4

Section 4 32

Conche - 1
Englee - 18
Roddickton - 2
Jackson's Arm - 9
Sop's Arm - 1
Hampden - 1

Section 5 8

Fleur de Lys - 3
Brent's Cove - 1
Harbour Round - 2
LaScie - 2

AREA B

Section 6 3

Nippers Harbour - 1
Leading Tickles - 2

Section 7 26

Comfort Cove - 1
Bridgeport - 1
Virgin Arm - 1
Durrells - 15
Hillgrade - 1
Kettle Cove- 1
Twillingate - 5
Cobb's Arm - 1

Section 9 9

Aspen Cove - 3
Lumsden - 4
Cape Freel's - 2

AREA C

Section 10 42

Newtown - 10
Pound Cove - 1
Wesleyville - 15
Brookfield - 1
Badger's Quay - 6
Valleyfield - 1
Greenspond - 8

AREA C

Section 11 30

Wareham - 2
Centerville - 1
Dover - 3
Hare Bay - 2
St. Chads - 2
Easport - 7
Salvage - 12
Glovertown - 1

Section 12 1

Happy Adventure - 1

Section 13 2

Bonavista - 2

AREA D

Section 15 5

Champney's East - 1
Port Rexton - 4

Section 16 1

Old Bonaventure - 1

Section 17 3

New Harbour - 3

AREA E

Section 22 1

Holyrood - 1

Section 23 1

Bauline - 1

AREA F

Section 24 1

Torbay - 1

AREA O

Section 51

Lodge Bay - 1
Pinsent's Arm - 2
Charlottetown - 1

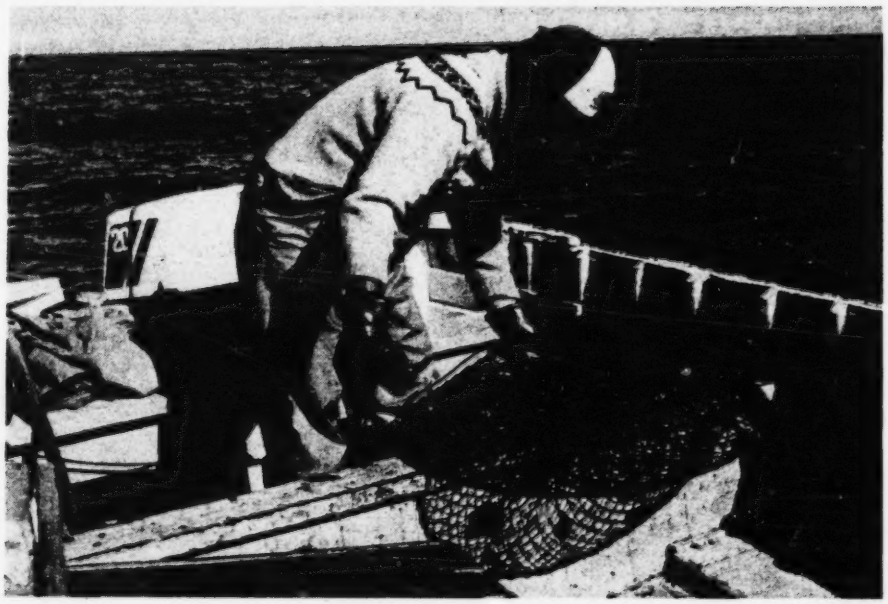
Section 52

Paradise River - 1
Cartwright - 1

APPENDIX II

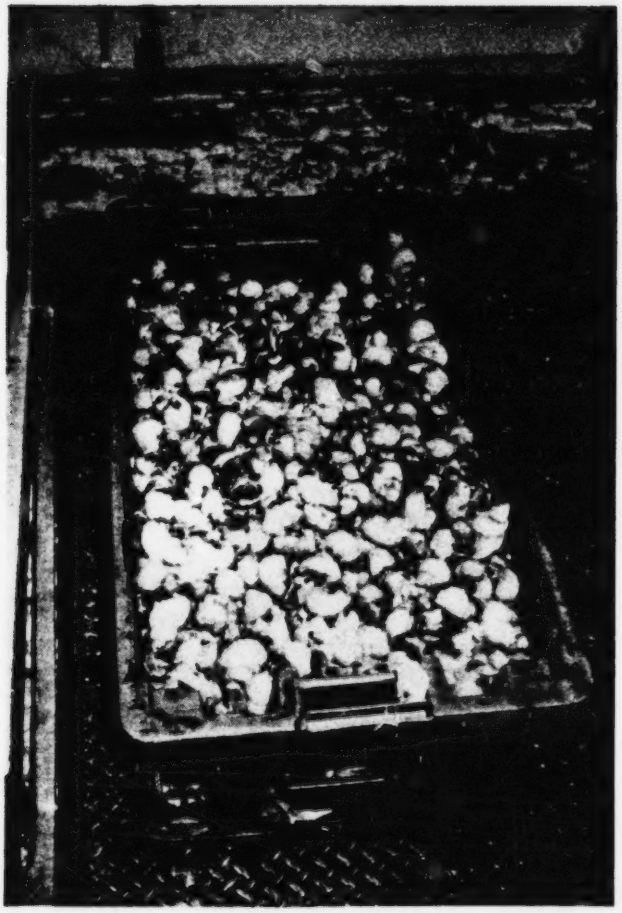
PICTORIAL OF WHELK HARVESTING AND PROCESSING

WHELK (Buccium undatum) IN THE SHELL



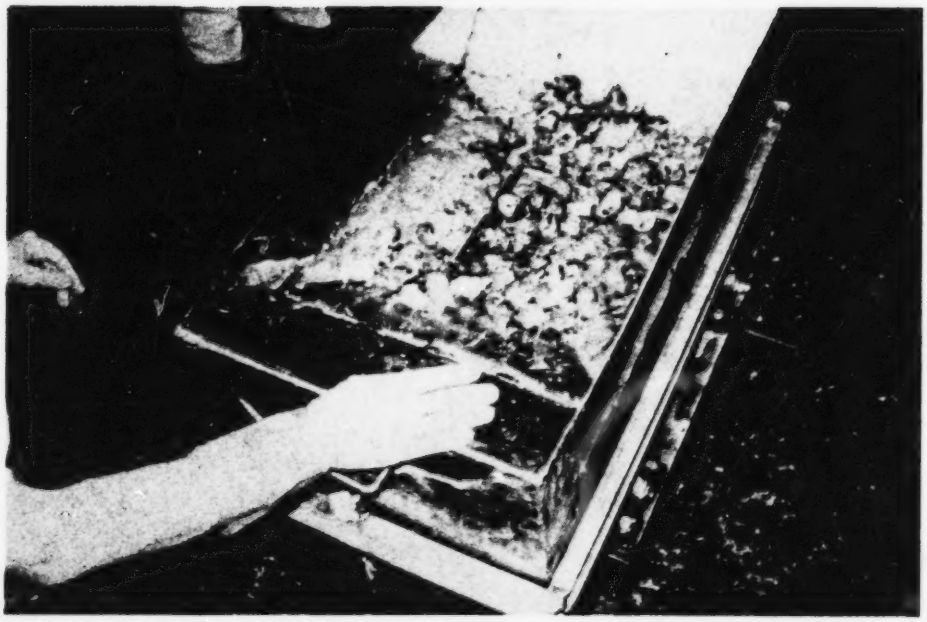
SETTING STANDARD WHELK POT

LIFTING WHELK POT

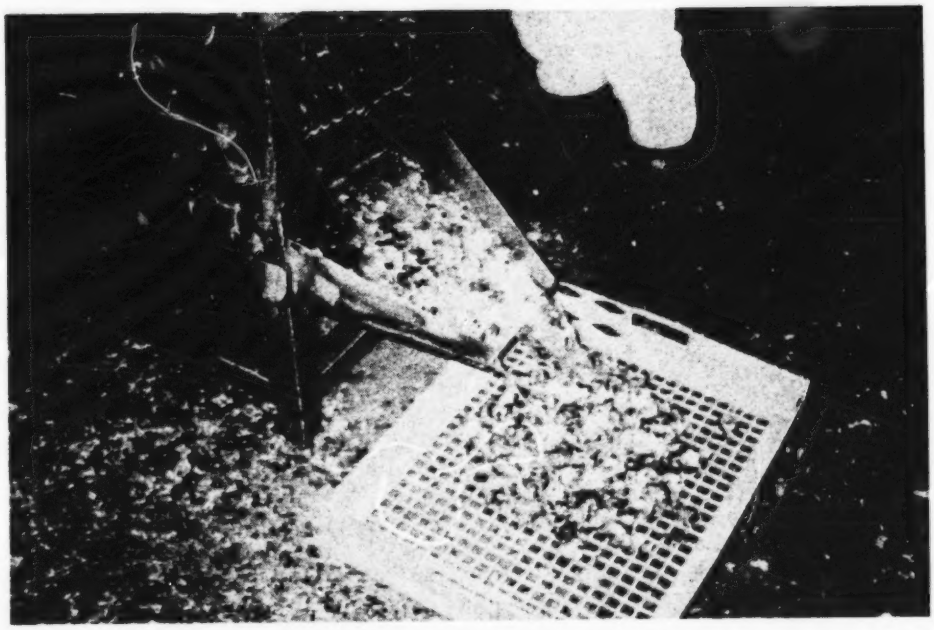


WHELKS READY FOR PROCESSING

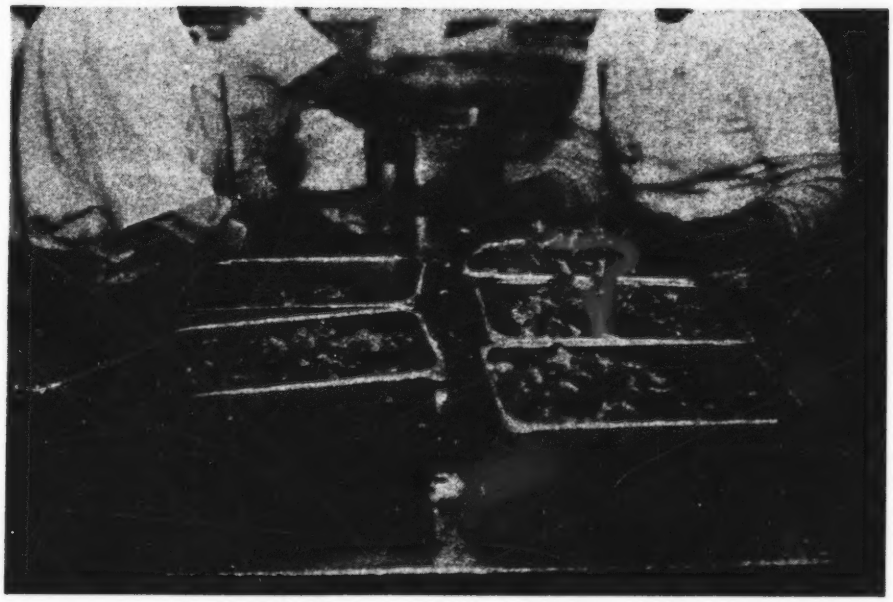
WHELKS ENTERING CRUSHER



CRUSHING OF WHELKS

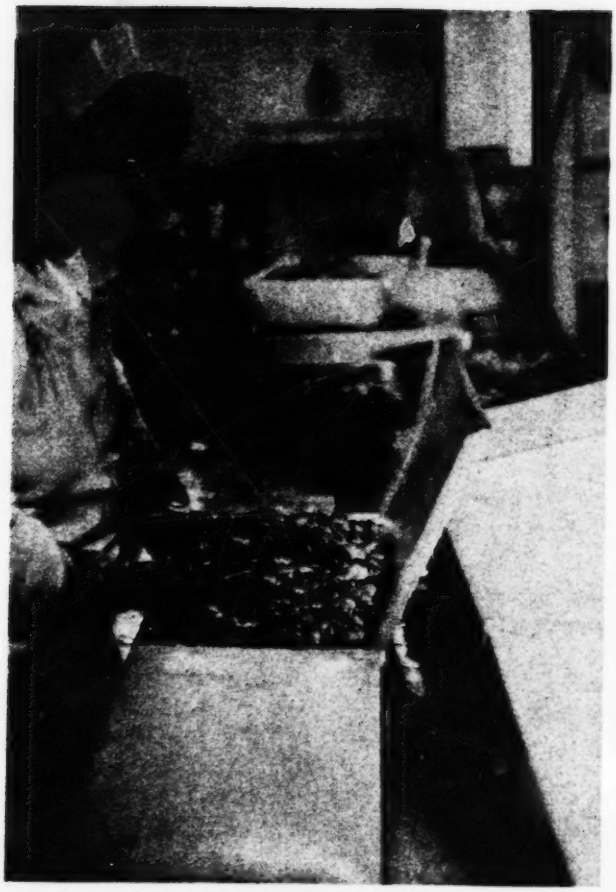


CRUSHED WHELKS (MEAT AND SHELL) EXIT CRUSHER



REMOVING SHELL AND GUT FROM WHELKS

WEIGHING WHELK MEAT PRIOR TO PACKING



PACKING WHELK MEAT

FREEZING OF WHELK MEAT